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Spartothamnella canescens (Lamiaceae: Chloantheae), a new species from Western and Central Australia, with notes on the status of *S.* sp. Helena & Aurora Range

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Abstract

Thiele, K.R. & Shepherd, K.A. *Spartothamnella canescens* (Lamiaceae: Chloantheae), a new species from Western and Central Australia, with notes on the status of *S.* sp. Helena & Aurora Range. *Nuytsia* 24: 177–185 (2014). Morphological assessment of the informally named *Spartothamnella* sp. Helena & Aurora Range (P.G. Armstrong 155-109) shows it is not distinct from Western Australian populations of *S. puberula* (F.Muell.) Maiden & Betche. However, examination of *S. puberula s. lat.* shows that Western and Central Australian populations are morphologically distinct from typical populations in eastern Australia. Accordingly, *S. canescens* K.R.Thiele & K.A.Sheph. is newly described to accommodate these atypical populations. A revised description of *S. puberula* and a modified key for the genus are provided.

Introduction

Spartothamnella Briq. (Lamiaceae: subfam. Prostantheroideae Luerss.: tribe Chloantheae Benth. & Hook.f.) is a small genus endemic to the Australian mainland. When it was last revised by Munir (1976), three species were recognised: *S. juncea* (A.Cunn. ex Walp.) Briq. from south-west of Cairns (Qld) to Condobolin (NSW); *S. teucriiflora* (F.Muell.) Moldenke from Shark Bay (WA) to Gunnedah (NSW); and *S. puberula* (F.Muell.) Maiden & Betche from three disjunct areas in the Pilbara (WA), Central Australia and eastern Australia (Figure 1).

Spartothamnella sp. Helena & Aurora Range (P.G. Armstrong 155-109) was erected in 2004 (Western Australian Herbarium 1998–) by Malcolm Trudgen to accommodate a small number of specimens brought to his attention by Shapelle McNee, collected from the foothills and upper slopes of Banded Iron Formations on the Blue Hill Range south of Yalgoo and the Helena and Aurora Range north-east of Koolyanobbing (WA). *Spartothamnella* sp. Helena & Aurora Range was regarded as distinct from *S. puberula* in having 'much larger calyx lobes and the leaves being tightly revolute (rather than the margins only being revolute)' (M. Trudgen, *in sched.*). It was also considered at the time to have a more southerly distribution, occurring *c.* 900 km south of the nearest known populations of *S. puberula*. *Spartothamnella* sp. Helena & Aurora Range is currently listed as Priority Three under Department of Parks and Wildlife Conservation Codes for Western Australian Flora (Smith 2013).

In the ten years since the phrase name was proposed, new populations referable or similar to the Helena and Aurora Range plants and to *S. puberula* have been collected from scattered localities in the

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Coolgardie and Yalgoo bioregions (Figure 1). This broader range of material has allowed a more thorough assessment of variation within and between populations assigned to *S.* sp. Helena & Aurora Range and *S. puberula* from Western Australia, and between populations of *S. puberula* throughout its range.

Methods

All specimens of *S. puberula* and *S.* sp. Helena & Aurora Range held at PERTH, BRI, CANB, DNA and NSW were examined.

Specimens from Western Australia and the Northern Territory were examined in detail for a morphometric analysis of characters used by M. Trudgen to separate *S.* sp. Helena & Aurora Range from *S. puberula*. Three leaves were measured per specimen, recording leaf length and apparent width at midpoint. 'Apparent' width refers to the projected width of the leaf, whether flat or recurved; the width of leaves with a strongly recurved lamina would be substantially broader if flattened. A calyx lobe from each of three separate flowers was measured per specimen. For consistency, calyx lobes enclosing mature fruits were used, as the calyx lobes in *Spartothamnella* are accrescent.

Corolla measurements in descriptions are from rehydrated flowers; all other measurements are from dried material.

The distribution map is based on specimen records from *Australia's Virtual Herbarium* (Council of Heads of Australasian Herbaria 2014); bioregions are based on the *Interim Biogeographic Regionalisation for Australia* (Department of the Environment 2013).

Results

No significant differences are apparent in leaf dimensions (Figure 2) and indumentum or in flower characters including the length and width of calyx lobes (Figure 3) between plants determined as *S.* sp. Helena & Aurora Range and those determined as *S. puberula* from elsewhere in Western and Central Australia.

In most (though not all) plants of *S.* sp. Helena & Aurora Range, the leaf margins are revolute nearly to the midrib, resulting in a linear to narrowly elliptic leaf outline and obscured abaxial surface. In contrast, most (though not all) plants of *S. puberula* from elsewhere in Western Australia and in Central Australia exhibit leaf margins that are narrowly revolute, resulting in an elliptic leaf outline and exposed abaxial surface. However, the degree of recurvation on a single specimen differs depending on the stage and strength of growth or degree of shading. Young or shaded leaves exhibiting strong growth are generally flatter and less recurved than leaves on more exposed or slower-growing branches. Calyx lobes were not different between the populations. The observed differences between *S.* sp. Helena & Aurora Range and Western Australian and Central Australian populations of *S. puberula* are not considered sufficient to warrant recognition of the former as a distinct taxon.

However, morphological assessment of specimens of *S. puberula* from throughout its range revealed a significant and consistent indumentum difference between populations in Western and Central Australia on one hand, and eastern Australian plants on the other, with each variant morphologically quite uniform throughout its range. The type of *Spartothamnus junceus* var. *puberulus* F.Muell. (the basionym of *S. puberula*) is of the eastern variant. Accordingly, the Western and Central Australian populations are here recognised as a distinct new species, *S. canescens* K.R.Thiele & K.A.Sheph.

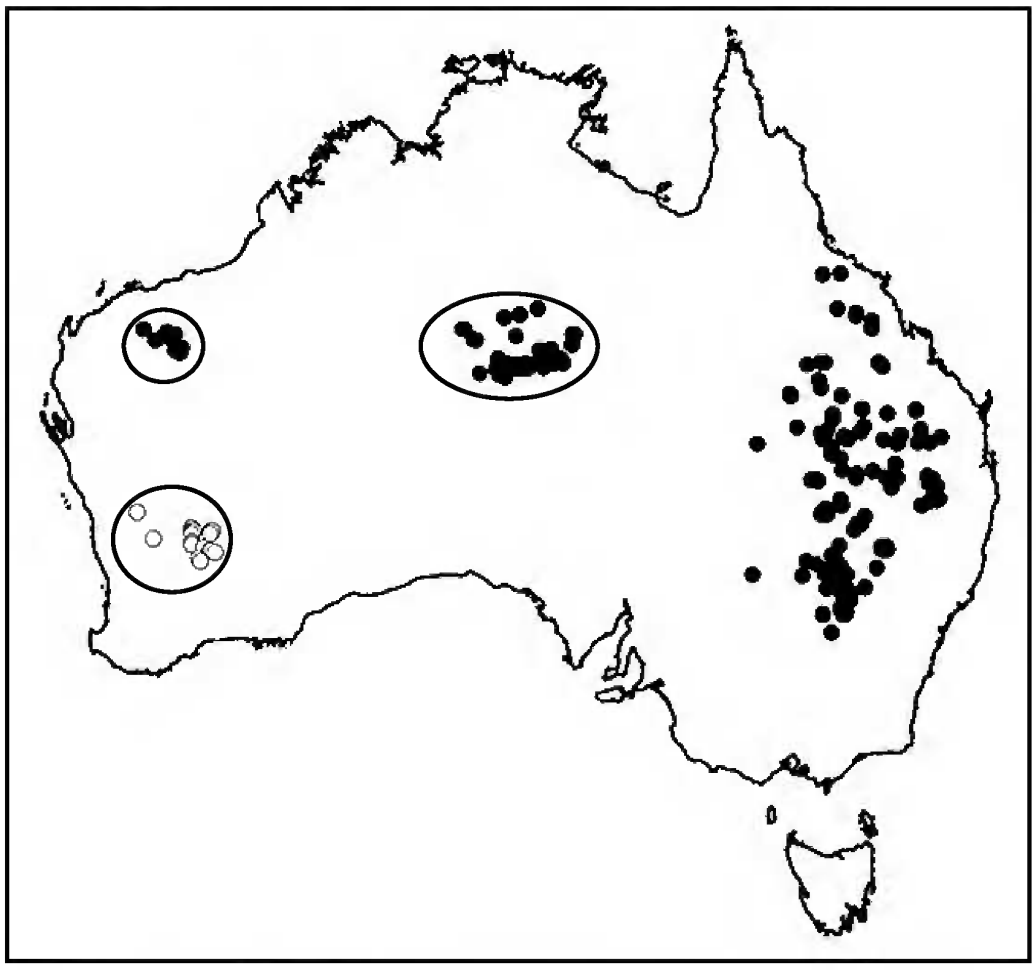

Figure 1. Distribution of *Spartothamnella puberula* prior to recircumscription (●), showing three disjunct areas of occurrence in Western, Central and eastern Australia, and *S.* sp. Helena & Aurora Range (P.G. Armstrong 155-109) (○), circled populations represent the distribution of the newly recognised *S. canescens* in Western and Central Australia.

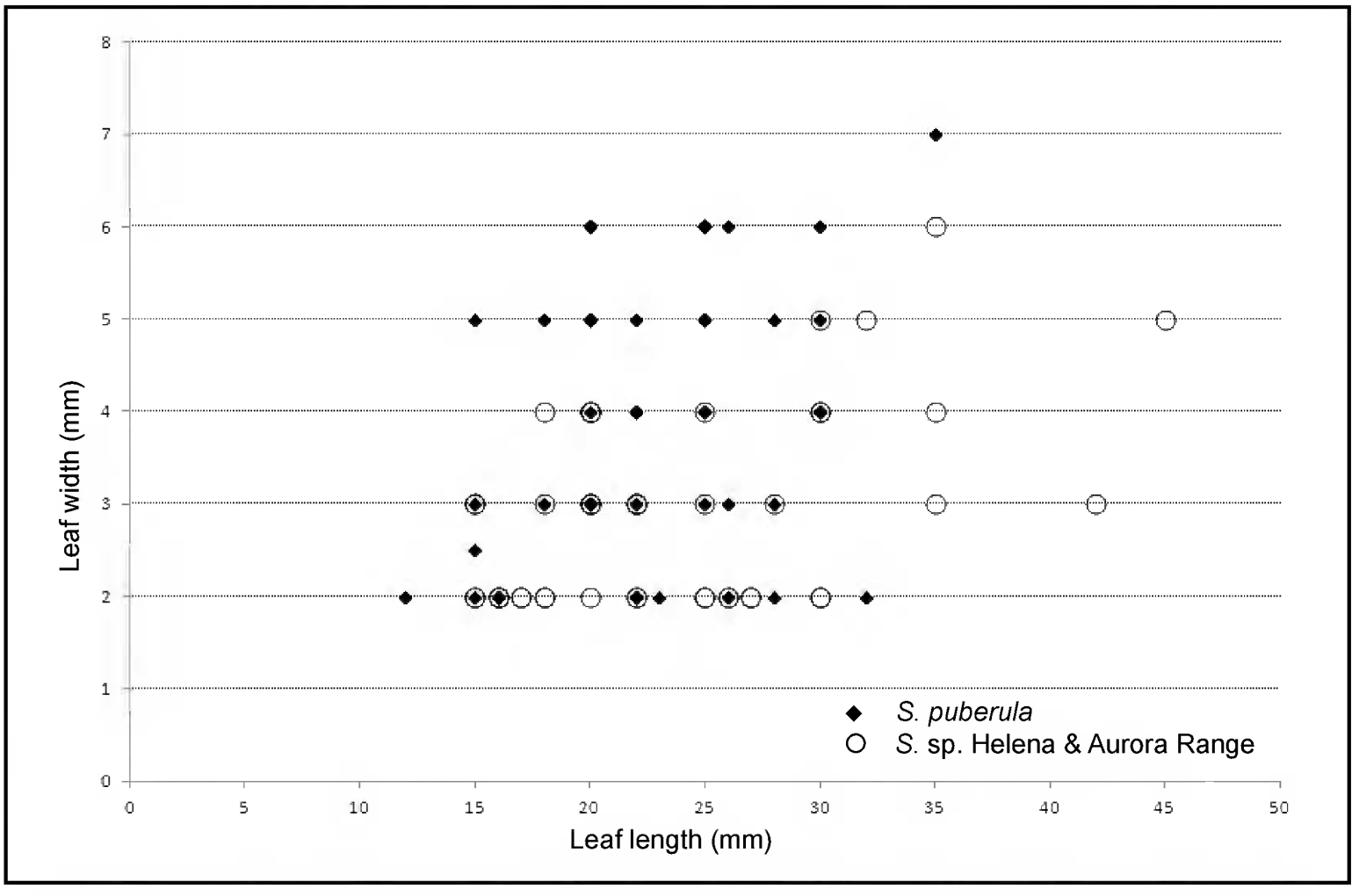

Figure 2. Scatter plot of leaf length and apparent width at midpoint of all PERTH specimens of *Spartothamnella puberula* and *S.* sp. Helena & Aurora Range, and representative Central Australian specimens of *S. puberula* from DNA. Each symbol represents a single leaf.

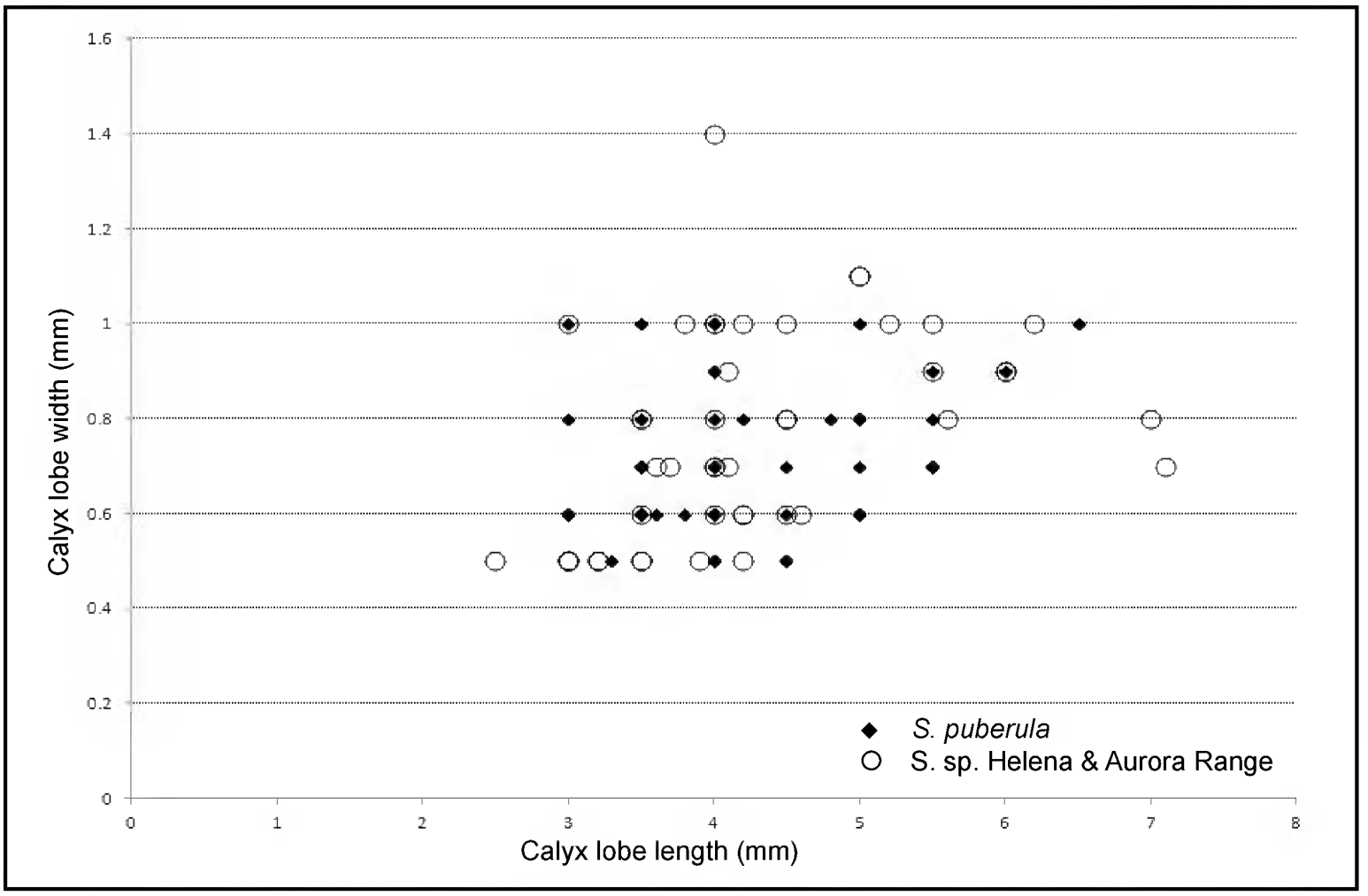

Figure 3. Scatter plot of calyx lobe length and width at midpoint of all PERTH specimens of *Spartothamnella puberula* and *S.* sp. Helena & Aurora Range, and representative Central Australian specimens of *S. puberula* from DNA. Each symbol represents a calyx lobe from a single flower.

Taxonomy

Spartothamnella canescens K.R.Thiele & K.A.Sheph., *sp. nov.*

Type: Mount Riddock, Northern Territory, 13 September 1973, *P.K. Latz* 4310 (*holo*: DNA A0052527 (DNA 52527); *iso*: AD, CANB!, NSW, BRI!, PERTH 02527383!).

Spartothamnella sp. Helena & Aurora Range (P.G. Armstrong 155-109), Western Australian Herbarium, in *FloraBase*, http://florabase.dpaw.wa.gov.au [accessed 14 January 2014].

Erect, openly branched *shrub* 0.3–0.8(–1.5) m high, single- or multi-stemmed at base; stems dull grey-green, acutely 4-angled, longitudinally striate, moderately to densely canescent with abundantly branched hairs to 0.4 mm long underlain by sparse to dense, sessile, globular glands, the surface usually obscured by the indumentum. *Leaves* sessile, (8–)15–25(–45) mm long, (1.5–)3–5(–9) mm broad, ovate to elliptic (sometimes appearing linear through recurvation of the margin), attenuate to base, the apex obtuse to acute, moderately to densely canescent adaxially with branched hairs, moderately to densely canescent abaxially with branched hairs underlain by sessile, globular glands especially between the veins; margins narrowly to broadly revolute, sometimes to the midrib. *Flowers* sessile to shortly pedicellate, solitary in the axils of leaf-like bracts towards the ends of branches; bracteoles similar in shape and indumentum to the leaves and bract, 2.5–8 mm long, 0.5–1.8 mm broad. *Calyx* exceeding the corolla, accrescent; tube ribbed, *c.* 1 mm long, glabrous inside, canescent outside with branched hairs and sessile glands; lobes narrowly triangular with a distinct midrib and revolute margins, spreading, 1.8–2.5 mm long at anthesis, 3–7 mm long in fruit, canescent outside

with branched hairs and sessile glands. *Corolla* white, glabrous outside at base otherwise pubescent with simple to sparsely branched hairs, glabrous inside except for the villous throat; tube ± cylindrical, 0.8–1.4 mm long; lobes spreading at anthesis; anterior lobe ± elliptic-oblong, 1.5–2 mm long; lateral and posterior lobes ± equal, similar in shape to the anterior lobe but slightly shorter. *Stamens* shortly exserted; filaments villous towards the base; anthers ± reniform, with sessile, globular glands on the back of the connective. *Ovary* globose, faintly 4-lobed when young, sparsely to densely covered with sessile, globular glands in the upper half. *Style* exserted, filiform, glabrous except for some sessile, globular glands towards the base, 2-branched at apex. *Fruit* globular, glossy orange-red, shorter than or scarcely exceeding the persistent open calyx, 3–4 mm diam., glabrous or with scattered sessile, globular glands in the upper half. (Figures 4, 5A)

Diagnostic features. *Spartothamnella canescens* can be discriminated from all other species of *Spartothamnella* in having a dense, canescent indumentum of abundantly branched hairs on stems (Figure 5A), abaxial and adaxial leaf surfaces and calyces, the hairs usually obscuring or nearly obscuring the underlying surface.

Selected specimens. NORTHERN TERRITORY: 10 km NE Neutral Junction Homestead, 14 May 1996, *D. Albrecht* 7509 *& P. Latz* (DNA, MEL); Standley Chasm, Larapinta Trail *c.* 0.5 km NNW of carpark, 1 Sep. 1998, *D.E. Albrecht* 11628 (DNA); Standley Chasm, 7 June 1974, *G.W. Carr* 1359 (MEL); Standley Chasm, 23 May 1957, *N. Forde* 831 (MEL); 2 km E of Hugh Gorge mouth, E Chewings Range, 2 Oct. 1984, *P.K. Latz* 9980 (AD, CBG, DNA); 24 km SW of N'Dhala Gorge, 10 June 1987, *G. Leach* 1353 (AD, DNA, MO); inner N rock walls of Gosses Bluff, S of MacDonnell Range and *c.* 160 km WSW of Alice Springs, 26 June 1966, *J.H. Willis s.n.* (MEL). WESTERN AUSTRALIA: Helena and Aurora Range, 1 Nov. 2000, *P.G. Armstrong* 155-109 (PERTH); W Jackson Range, J1 iron ore deposit, 480 m W of Evanston Road, *c.* 117 km N of Southern Cross, 25 Jan. 2007, *G. Cockerton & S.A. McNee* LCS 12855 (PERTH); Blue Hill Range, 22 Nov. 1992, *R.J. Cranfield* 8587 A (PERTH); proposed Jaurdi Conservation Park, 14 July 2009, *J. Jackson* 33 (PERTH); adjacent to track that goes S–W from Hospital Rocks, off the Evanston to Menzies Road, *c.* 1.5 km SW from Hospital Rocks, *c.* 90 km WSW of Menzies, 13 Apr. 2011, *S. Reiffer* SRE 621 (PERTH); Silvergrass East, 64 km NW of Tom Price, 4 Sep. 2007, *E. Thoma* ET 1355 (PERTH); at base of cliffs half way up S side of Mount Bruce, Hamersley Range National Park, 22 June 1975, *M.E. Trudgen* 1319 (AD, CANB, PERTH); Remlap Station site I761, 23 Oct. 1993, *S. Van Vreeswyk* 30090 (PERTH).

Phenology. Flowers and fruits almost throughout the year, with an apparent peak from May to November.

Distribution and habitat. *Spartothamnella canescens* occurs in three widely disjunct areas (Figure 1), one in the southern Northern Territory in the MacDonnell Ranges, Burt Plain and adjacent parts of the Great Sandy Desert bioregions, and two in Western Australia (the Pilbara, and in scattered localities between Mount Gibson and Koolyanobbing in the Yalgoo and Coolgardie and adjacent parts of the Murchison and Avon Wheatbelt bioregions). Throughout its range it occurs in rocky hills, gorges and on scree slopes, often in sheltered locations such as on south-facing slopes, at the bases of cliffs and in gorges, sometimes on flatter and more exposed locations in the Yalgoo and Coolgardie bioregions. Central Australian plants mostly occur on sandstone or quartzite, Western Australian ones on or near banded ironstone.

Conservation status. *Spartothamnella canescens* is widely distributed and common in both Western and Central Australia, and is not considered under threat. Some specimen labels note that it only occurs in fire-sheltered sites; many describe it as locally rare with few individuals seen at any locality.

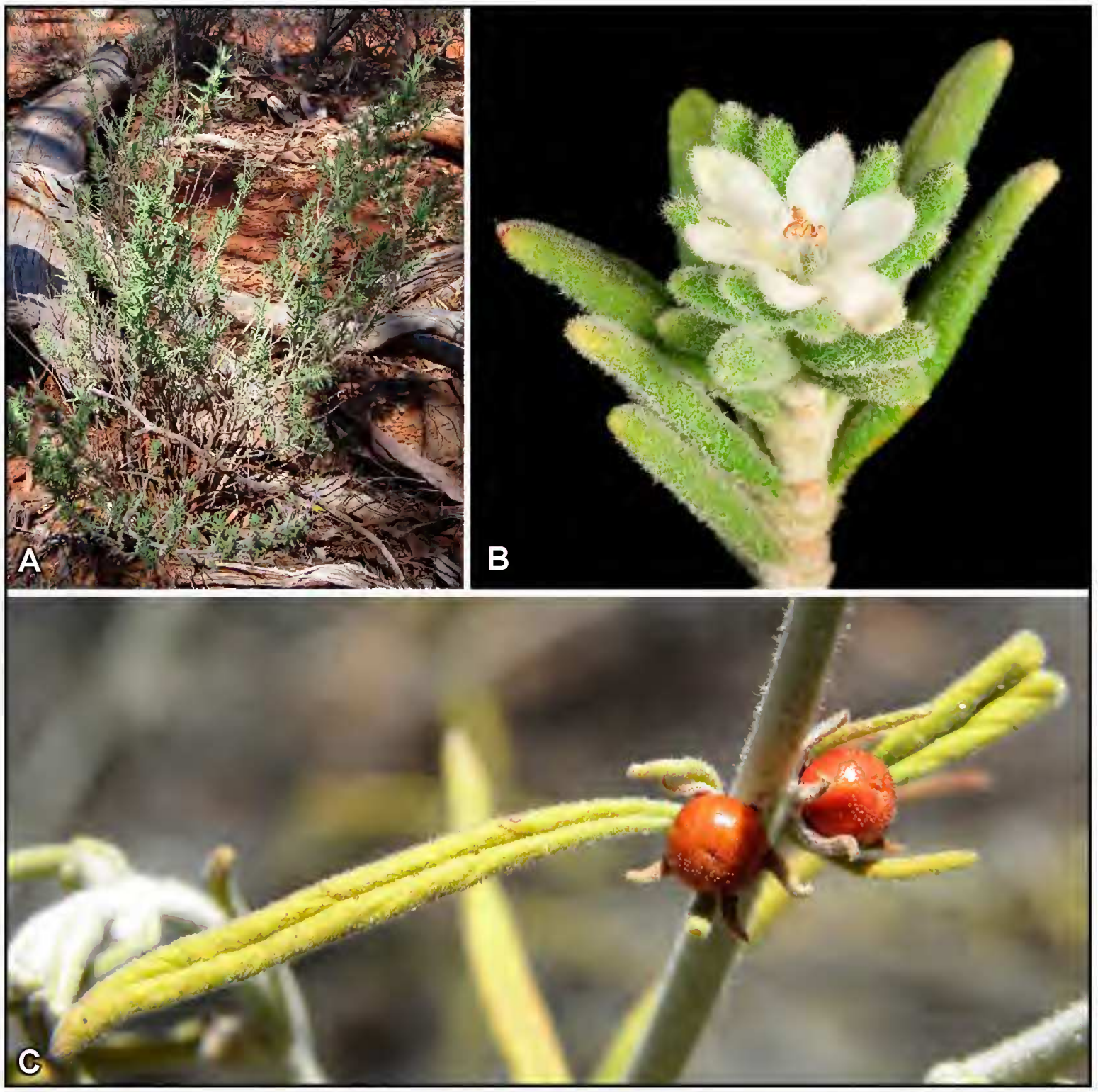

Figure 4. *Spartothamnella canescens*. A – mature plant *in situ*; B – flower (*G. Cockerton* LCS 12853, PERTH 7492316); C – branchlet with glossy orange-red fruits and persistent calyces, with moderately canescent leaves and stems. Images: A – Jennifer Jackson, B – Kevin Thiele, C – Melanie Smith.

Etymology. The epithet is derived from the Latin *canescens* (becoming grey or greyish), in reference to the distinctive grey-hoary indumentum evident on the stems and leaves.

Affinities. *Spartothamnella canescens* is closely related to *S. puberula*. The latter has a sparse indumentum of short (to 0.25 mm long), branched hairs on stems (Figure 5B), calyces, on the edges of the leaf lamina and on the midrib and major leaf-veins beneath. The adaxial leaf lamina mostly bears short, simple or once-branched hairs except on the margins, while the abaxial lamina is generally very sparsely hairy (sometimes almost glabrous) between the veins. The underlying surface is clearly visible beneath the indumentum on all parts, and is generally green, giving the plant an overall green appearance. By contrast, in *S. canescens* the indumentum on all parts is significantly more dense, comprising longer (to 0.4 mm long) hairs which ± obscure the underlying surface (Figure 5A), which is more grey-green in colour. Adaxial and abaxial leaf surfaces bear a mid-dense to dense indumentum of branched hairs throughout. Both the indumentum and surface colour result in a greyer overall

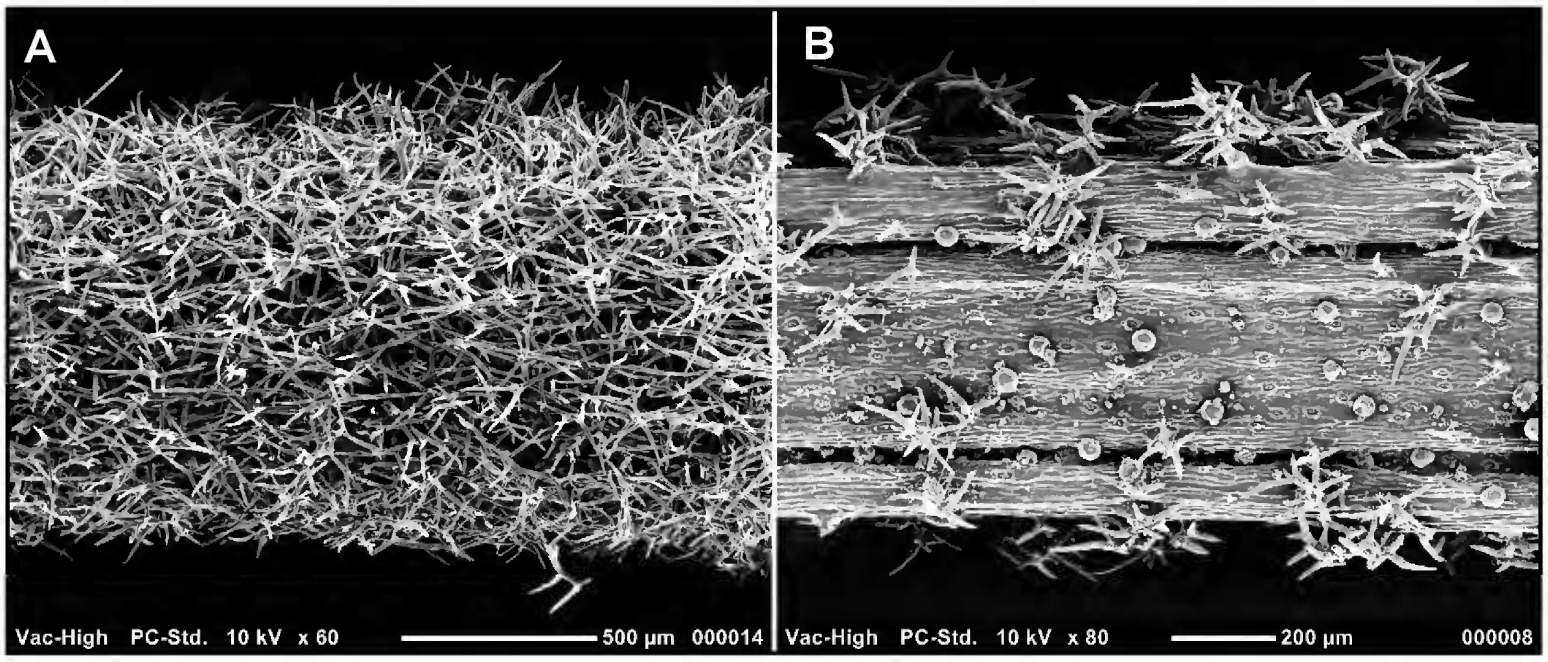

Figure 5. Stem indumentum. A – *Spartothamnella canescens* (*J. Jackson* 33, PERTH 8295859); B – *S. puberula* (*W. Baeuerlen s.n.*, BRI AQ538974).

appearance for *S. canescens* than *S. puberula*. Leaves are generally larger in *S. canescens* (to 45 mm) than in *S. puberula* (to 22 mm).

Judging from descriptions on specimen labels, *S. canescens* is a taller, more openly branched shrub than *S. puberula*; specimens of the latter are often described as 'herbs' or subshrubs and as abundantly multi-branched from a woody base. It is likely that *S. puberula* is a fire-tolerant resprouter, while *S. canescens* is single-stemmed at base, fire-killed and restricted to fire-sheltered sites.

Spartothamnella puberula (F.Muell.) Maiden & Betche, *Census N.S.W. Pl.*: 177 (1916). *Spartothamnus junceus* var. *puberulus* F.Muell., *S. Sci. Rec.* 2: 55 (1882). *Type citation*: 'It is known to me only from near the Cape River, Suttor River, Maranoa and Warrego' (*lecto*: from near the Suttor River, Queensland, 1856, *F. Mueller s.n.* (MEL 68872!), *fide* A.A. Munir, *J. Adelaide Bot. Gard.* 1(1): 9 (1976); *isolecto*: K).

Sub-shrubs 0.2–0.8 m high, sometimes taller to 1.5 m, often multi-stemmed from base; stems grey-green to green, acutely 4-angled, longitudinally striate, with sparse to moderately dense, short branched hairs to 0.25 mm long and scattered sessile, globular glands, the surface clearly visible beneath the indumentum. *Leaves* sessile, (5–)10–15(–22) mm long, (1–)2–4(–6) mm broad, narrowly ovate to ovate to elliptic, attenuate to base, the apex obtuse to acute, sparsely to moderately pubescent adaxially with mostly simple hairs (often with a few branched hairs near the margins), very sparsely to (rarely) moderately pubescent to almost glabrous abaxially except for moderately densely arranged, sessile, globular glands, the hairs when present simple to few-branched and mostly restricted to veins; margins narrowly revolute. *Flowers* sessile to shortly pedicellate, solitary in the axils of leaf-like bracts towards the ends of branches; bracteoles similar in shape and indumentum to the leaves and bract, 1.5–5 mm long, 0.5–1.5 mm broad. *Calyx* exceeding the corolla, accrescent; tube ribbed, *c.* 1 mm long, glabrous inside, canescent outside with simple and branched hairs and sessile glands; lobes narrowly triangular with a distinct midrib and revolute margins, spreading, 1.5–3.0 mm long at anthesis, 3–5 mm long in fruit, canescent outside with simple and branched hairs and sessile glands. *Corolla* white, glabrous outside at base otherwise pubescent with simple to sparsely branched hairs, glabrous inside except for the villous throat; tube ±cylindrical, 0.8–1.1 mm long; lobes spreading at anthesis; anterior lobe ± elliptic-oblong, 1.4–1.6 mm long; lateral and posterior lobes ± equal, similar in size and shape to the anterior lobe but slightly shorter. *Stamens* shortly exserted; filaments villous towards the base;

anthers ± reniform, with sessile, globular glands on the back of the connective. *Ovary* globose, faintly 4-lobed when young, sparsely to densely covered with sessile, globular glands in the upper half. *Style* exserted, filiform, glabrous except for some sessile, globular glands towards the base, 2-branched at apex. *Fruit* globular, glossy orange-red, shorter than or scarcely exceeding the persistent open calyx, 3–4 mm diam., glabrous or with scattered sessile, globular glands in the upper half. (Figure 5B)

Selected specimens. NEW SOUTH WALES: Nyngan, Nov. 1899, *W. Baeuerlen s.n.* (BRI, CANB, MO, NSW); Boppy Mount, Cobar District, 1903, *W. Baeuerlen s.n.* (MEL, NSW); Gulargambone, 6 Oct. 1886, *E. Betche* (MEL, NSW). QUEENSLAND: Milmerran–Goondiwindi Road, 51.2 km from Milmerran, 22 Feb. 1996, *A.R. Bean* 9929 (BRI, MEL, NSW); *c.* 41 km along Shirlo Road, NW of Bollon, 18 Mar. 2001, *A.R. Bean* 17542 (BRI); northern end of 'Havelock', *c.* 58 km N of Mitchell, 23 Nov. 2007, *A.R. Bean* 26916 (BRI); 14.5 km W of Charters Towers town centre towards Pentland, 12 June 2003, *R.J. Cumming* 21610 (BRI); Precipice National Park, catchment of Cables Creek, 26 Sep. 1996, *P.I. Forster* PIF19762 (BRI); Thomby Range, W of 'Glen Fosslyn', 41km SE of Surat, 3 July 2003, *P.I. Forster* PIF29429 (BRI, MEL, NSW); Idalia National Park headquarters, 113 km SW of Blackall, Penelope Radio Tracking Tower, 10 May 1999, *S. Nicholls* SN038; Idalia National Park, 113 km SW of Blackall, Dead Wallaroo Road, 5 June 2000, *S. Nicholls* SN219 (BRI); 2.5 km towards Moranbah from Mt Coolon–Clermont Road, 22 Jan. 1998, *S. Thompson* 492 *& I. Fox* (BRI, NSW); Roma, 24 Oct. 1941, *C.T. White* 9461 (BRI).

Phenology. Flowers and fruits almost throughout the year, with an apparent peak from June to November.

Distribution and habitat. *Spartothamnella puberula* occurs widely in Queensland and New South Wales west of the Great Dividing Range, from Charters Towers south to Toowoomba (Qld) and Condobolin (NSW) and west to Wilcannia (NSW), in the Brigalow Belt North, Brigalow Belt South, Mulga Lands and Cobar Peneplain bioregions (Figure 1).

Conservation status. *Spartothamnella puberula* is widely distributed, and is not considered under threat, although it is often recorded as sparse to uncommon at any given site. Some specimen labels indicate that it appears to be sensitive to grazing by stock and native animals.

Affinities. See notes under *S. canescens*. Three specimens are somewhat unusual. *S. Nicholls* 38 (BRI AQ668382) and *S. Nicholls* 219 (BRI AQ718645) from Idalia National Park (Qld) have a somewhat more dense and longer indumentum than is typical for the species, approaching that of *S. canescens*. In both cases some hairs in the adaxial leaf surface indumentum are few-branched. *A.R. Bean* 26916 (BRI AQ729428) from 58 km N of Mitchell (Qld) has unusually short leaves and sepals and an unusually dense indumentum. The hairs on the adaxial leaf surface are mostly simple with some branched hairs evident. These specimens, while approaching in some ways *S. canescens*, nevertheless differ from that species and may be clearly ascribed to *S. puberula*.

Key to species of *Spartothamnella*

(Modified from Munir 1976)

1. Stems with branched hairs; leaves usually persistent; flowers sessile or very shortly pedicellate; calyx longer than corolla

2. Stems and leaves grey-hoary with abundant branched hairs, the underlying surface obscured or nearly so by the indumentum; leaf adaxial surface with sparse to dense branched hairs; whole plant greyish in aspect ..... **S. canescens**

2: Stems and leaves with scattered branched hairs, the surface clearly visible beneath the indumentum; leaf adaxial surface with simple or very sparingly branched hairs, with scattered branched hairs on the margin only; whole plant with a green aspect..... **S. puberula**

1: Stems glabrous or with simple hairs; leaves caducous; flowers pedicellate; calyx shorter than corolla

3. Plant glabrous; stems acutely 4-angled, longitudinally striate; pedicel and calyx glabrous..... **S. juncea**

3: Plant grey-puberulous when young, glabrescent; stems obtusely 4-angled, non-striate; pedicel and calyx grey-puberulous .....**S. teucriiflora**

Acknowledgements

We thank Jennifer Jackson and Geoff Cockerton for bringing to our attention the need for a resolution of the status of *Spartothamnella* sp. Helena & Aurora Range, and the Directors and staff of BRI, DNA, MEL and CANB for access to material. Jennifer Jackson and Melanie Smith are thanked for supplying images.

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